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EXAMINER	
LE, LANA N	

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2685	4

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/856,746	VAISANEN ET AL.	
	Examiner	Art Unit	
	Lana N Le	2685	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 May 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *24 May 2001* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Drawings

Figure 1 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawing sheets are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

1. This application does not contain an abstract of the disclosure as required by 37 CFR 1.72(b). An abstract on a separate sheet is required.

2. The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

Arrangement of the Specification

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

(a) TITLE OF THE INVENTION.
(b) CROSS-REFERENCE TO RELATED APPLICATIONS.

(c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
(d) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC (See 37 CFR 1.52(e)(5) and MPEP 608.05. Computer program listings (37 CFR 1.96(c)), "Sequence Listings" (37 CFR 1.821(c)), and tables having more than 50 pages of text are permitted to be submitted on compact discs.) or
REFERENCE TO A "MICROFICHE APPENDIX" (See MPEP § 608.05(a). "Microfiche Appendices" were accepted by the Office until March 1, 2001.)
(e) BACKGROUND OF THE INVENTION.
(1) Field of the Invention.
(2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.
(f) BRIEF SUMMARY OF THE INVENTION.
(g) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).
(h) DETAILED DESCRIPTION OF THE INVENTION.
(i) CLAIM OR CLAIMS (commencing on a separate sheet).
(j) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).
(k) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc).

Headings of the specification format, the headings in caplock listed above: background of the invention including field of the invention and description of related art, summary of the invention, brief description of the drawings, detailed description of the invention, claims, and abstract of the disclosure is required to be labeled and to divide the specification into proper sections, also cross reference to continuation data for the 371 of PCT/FI99/00974 should be stated in the first sentence of specification.

Preliminary Amendment

3. The preliminary amendment filed on 05/24/01 has been received and made of record in the file.

Priority

4. Receipt is acknowledged of foreign priority papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Acknowledgment is made of applicant's claim for priority under 35 U.S.C. 119(a)-(d) based upon an application filed in Finland on 11/26/98. A claim for priority under 35 U.S.C. 119(a)-(d) cannot be based on said application, since the United States application was filed more than twelve months thereafter.

Claim Objections

5. Claims 1-3 are objected to because of the following informalities:

Claim 1, lines 13-14, "...converted digital and the baseband signal converted digital" is not appropriate sentence structure. "converted to digital and the baseband signal converted to digital" may be a better form.

Claim 1, line 6, --an RX--- should be ---a RX---;

Claim 1, line 14, ---received signal--- should be ---received carrier-frequency signal---;

Claim 1, line 15 ---the signal prosessing parts--- should be ---signal processing parts----;

Claim 2, line 3, --the information--- should be ---an information---;

Claim 2, line 5, the word –quadrature— should be inserted before –signal—;

Claim 2, line 5, "...converted analog" is not appropriate sentence structure, "converted to analog" may be a better form;

Claim 2, line 6, --an RX--- should be ---a RX---;

Claim 2, line 6, --the transmit--- should be ---a transmit---;

Claim 2, line 7, --the baseband signal--- should be ---the digital baseband quadrature signal---;

Claim 2, line 8, ---it--- after ---mixing---- should be ---the digital baseband quadrature signal----;

Claim 2, line 9, ---carrier-frequency signal--- should be ---carrier-frequency transmission signal--- to follow the antecedent basis of claim 2, line 7;

Claim 2, line 10, ---the transmission signal--- should be --- the amplified carrier-frequency transmission signal--- to follow the antecedent basis of claim 2, line 9;

Claim 2, line 11, the word ---prosessing--- after ---signal--- is misspelled, it should be –processing---;

Claim 2, line 11 ---the signal processing parts--- should be –signal processing parts---;

Claim 3, line 2, after ---it comprises--- there should be a ":" to list the parts of the receiver;

Claim 3, after line 2, the extra blank line should be deleted;

Claim 3, line 4, ---bandpass--- should be ---a bandpass---;

Claim 3, line 5, ---first receiver amplifier--- should be ---a first amplifier---;

Claim 3, line 6, --an RX-- should be ---a RX---, and –the receive-- should be ---a receive---;

Claim 3, line 9, add "a" before "low pass";

Claim 3, line 10, add "a" before "second";

Claim 3, line 11, add "an" before "analog", add "to" before "digital";

Claim 3, line 14, "the signal prosessing parts" in line 14 of claim 3 should be "signal processing parts";

Claim 12, line 2, after "comprises" a ":" should be added;

Claim 12, line 5, "a" should be added before "digital-to-analog";

Claim 12, line 7, "a" should be added before "synthesizer";

Claim 12, line 10, "transmitter" is unnecessary since the preamble already state a "transmitter" in line 1, "a" should be added at the beginning of line 10.

Claim 12, line 13, "the signal prosessing parts" should be "signal processing parts";

Appropriate correction is required.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 1, 3-4, and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Isberg et al (US 6,029,052) in view of Auvray (US 5,564,076).

Regarding claim 1, Isberg et al discloses a method for processing signals received from different radio interfaces of communication systems, (i.e. DCS and PCS; col 2, lines 13-16; col 4, lines 61-66), characterized in that it comprises:

steps in which a carrier frequency signal is received via antenna 10 (col 4, lines 61-66) from a radio interface of a system on one of a plurality of frequency bands (i.e. GSM; fig. 5; col 2, lines 15-16);

the signal at the carrier frequency is bandpass filtered via 12a, 12b, 12c (fig. 5 and hereafter; col 5, lines 1-3);

the filtered signal at the carrier frequency is amplified via 34a, 34b, 34d or via a common low noise amplifier for the branch 34b and 34d sharing a single mixing circuit 40, 41 and VCO 36 (col 5, lines 8-10; col 5, lines 18-21);

a RX mixing signal at the receive frequency is generated at numeral characters 36a, 36, 38, and reference character QUAD (col 5, lines 8-12),

a complex baseband signal (I, Q) is generated via 40a, 41a, 40, 41 from the received carrier frequency signal by mixing it with the RX mixing signal (col 5, lines 6-8, col 5, lines 12-15),

the baseband signal I, Q generated is low-pass filtered via 42a, 42b (col 5, lines 11-14),

and the baseband signal is processed via reference character block Baseband Processing so as to produce an information signal encoded and modulated into the received signal at the output of the reference character block Baseband Processing, wherein the signal processing parts, the common low noise amplifier for the branch 34b and 34d sharing a single mixing circuit 40, 41 and VCO 36, LPFs 42a, 42b, and Baseband Processing for processing receive frequency signal are common for signals received from at least two different radio interfaces of the two different communication systems, DCS and PCS (see figure 5; col 5, lines 25-32).

However, the cited prior art fails to further disclose:

the baseband signal generated is amplified or attenuated prior to analog to digital conversion; the baseband signal is converted to digital and is processed to produce an information signal.

Auvray discloses a baseband signal processing technique in dual-mode (col 4, lines 38-41) in which the baseband signal 232I, 232Q is amplified or attenuated (via amplifiers 234i and 234Q; fig. 2 and hereafter; col 5, lines 33-36) prior to analog to digital conversion; the baseband signal is converted to digital (via A/Ns 235I, 235Q; col 5, lines 33-37) and is processed (via DSP1 24) to produce an information signal 23

encoded and modulated into the received signal (col 5, lines 38-41). It would have been obvious to one of ordinary skill in the art at the time of the invention was made to have the baseband signal amplified prior to analog to digital conversion and processed in order to strengthen the baseband signal and to have a device that's capable of converting the received analog signal to digital so that the signal is convertable to a suitable binary code format to represent information suitable for further digital channel decoding and demodulation as suggested by Auvray (col 5, lines 38-41).

Regarding claim 3, Isberg discloses a direct-conversion receiver (fig. 5 and hereafter; col 2, lines 7-12) operating at different radio interfaces of different communication systems (i.e. DCS and PCS; col 2, lines 13-16; col 4, lines 61-66), characterized in that it comprises:

antenna means (10; col 2, lines 66-67) for receiving a carrier-frequency signal from a radio interface on one of a plurality of frequency bands (col 2, lines 15-16);

bandpass filter (12a, 12b, 12c) for filtering the carrier frequency signal (col 5, lines 1-3);

first receiver amplifier (34a, 34b, 34d) or via a common low noise amplifier for the branch 34b and 34d sharing a single mixing circuit 40, 41 and VCO 36 for amplifying the filtered carrier-frequency signal (col 5, lines 8-10; col 5, lines 18-21);

means (36, 36a, 38, and reference character QUAD) for generating an RX mixing signal at the receive frequency (col 5, lines 8-12);

mixing means (40a, 41a, 40b, 41b) for generating a complex baseband signal I, Q from the received signal by means of the RX mixing signal (col 5, lines 12-15; col 5, lines 6-8);

low-pass filter (42a, 42b) for filtering the baseband signal I, Q (col 5, lines 12-15);

means (reference character block Baseband Processing) for processing the baseband signal Processing so as to produce an information signal encoded and modulated into the received signal at the output of the reference character block Baseband Processing (see fig. 5),

wherein the signal processing parts (the common low noise amplifier for the branch 34b and 34d sharing a single mixing circuit 40, 41 and VCO 36, LPFs 42a, 42b, and Baseband Processing unit) for processing receive frequency signal are common for signals received from at least two different radio interfaces of the two different communication systems, DCS and PCS (fig. 5; col 5, lines 25-32).

However, the cited prior art fails to further disclose:

second amplifier for amplifying the baseband signal,

analog-to-digital converter for converting the baseband signal digital, and

means for processing the baseband signal converted digital so as to produce an information signal encoded and modulated into the received signal,

However, Auvray discloses:

second amplifier (234i, 234Q; fig. 2 and hereafter) for amplifying the baseband signal (col 5, lines 33-36),

analog-to-digital converter (A/Ns 235I, 235Q) for converting the baseband signal to digital (col 5, lines 33-37); and

means for processing the baseband signal converted to digital (DSP1 24) so as to produce an information signal 23 encoded and modulated into the received signal (col 5, lines 38-41).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have a second amplifier, an A/D converter, in order to further process the baseband signal for further amplification which strengthens the baseband signal and an A/D converter to convert the amplified baseband signal to a binary code format to represent information suitable for digital channel decoding and demodulation as suggested by Auvray (col 5, lines 38-40).

Regarding claim 11, Isberg et al and Auvray disclose the receiver of claim 3, wherein Isberg et al further disclose:

the receiver is characterized in that the signal processing path comprises substantially the same components (the common low noise amplifier for the branch 34b and 34d sharing a single mixing circuit 40, 41 and VCO 36, LPFs 42a, 42b, and Baseband Processing for processing receive frequency signal for connecting to the different radio interfaces of the multiple mode reception of each band at BPFs 12a, 12b (see figure 5; col 5, lines 25-32).

8. Claims 2, 12 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Auvray (US 5,564,076) in view of Razavi (RF Microelectronics, copyright 1998).

Regarding claim 2, Auvray discloses a method for processing signals transmitted to different radio interfaces of communication systems (system GSM DCS 1800 cellular radio and system Globalstar satellite radio; col 5, lines 3-13; col 4, lines 10-30; figs. 1 & 2), characterized in that it comprises steps in which a digital quadrature baseband signal is generated within GMSK modulator module 27 (a digital quadrature baseband signal is produced within the GMSK modulator 27 based on an input digital baseband signal 25 on the basis of the information signal to be transmitted (col 4, lines 49-51; see fig. 2 and hereafter); the digital baseband signal is converted to analog within GMSK modulator module 27 (col 4, lines 49-54);

a TX mixing signal (213i, 213Q) at the transmit frequency is generated (col 4, lines 55-63),

a carrier frequency transmission signal (218) is generated (col 4, lines 64-66) from the baseband signal (25) by mixing it with the TX mixing signal 213i, 213Q (from synthesizer loop 214-216; col 4, lines 55-63),

the carrier frequency signal generated (218) is amplified (via 217, 219; col 4, lines 64-66), and the transmission signal is transmitted to the radio interface via antenna 221 (col 4, lines 66-67),

wherein the signal processing parts (24, 215) for processing transmit frequency signal are common for signals received from at least two different radio interfaces (received in two modes via antenna 221, 226 being downconverted using the same synthesizer 215 and DSP1 24 as the transmission parts; see figure 2).

Auvray doesn't specifically disclose: specific components within the GMSK modulator module for producing a digital quadrature baseband signal and to convert the digital quadrature baseband signal to analog. Razavi discloses wherein a digital quadrature baseband signal is produced after the digital Gaussian filter produces a phase from the baseband data input to be mapped into an in phase and quadrature component, at sine ROM and cosine ROM, within the GMSK baseband pulse shaping in GMSK systems (figure 5.38, pages 150-153);

wherein the quadrature baseband signals, produced at sine ROM and cosine ROM, are fed to digital to analog converters DACs within the GMSK baseband pulse shaping system, wherein the Gaussian filter, integrator, sin ROM and cosine ROM corresponds to the GMSK modulator module 27 of Auvray and wherein the LPFs corresponds to LPFs 29i, 29Q of Auvray, and mixers with input omegaLO=omega c when there's a direct conversion system from baseband to radio frequency as in figure 5.39 of Razavi corresponds to analog subsystem 210 with analog mixers 211i and 211Q of Auvray). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the means to produce a quadrature signal and to convert the digital signal to analog within the GMSK modulator of Auvray in order to specify common specific components within a typical GMSK modulator to produce a quadrature signal more accurate digitally through a digital Gaussian filter first instead of analog and then convert the digital quadrature signal to an analog quadrature signal to analog mixers for as suggested by Razavi (page 150, lines 24-27).

Regarding claim 12, Auvray discloses a direct conversion transmitter operating at different radio interfaces of communication systems (system GSM DCS 1800 cellular radio and system Globalstar satellite radio; col 5, lines 3-13; col 4, lines 10-30; figs. 1 & 2), characterized in that it comprises:

- for generating a digital baseband signal within GMSK modulator module 27 (based on a digital baseband signal 25 from DSP1 24; see fig. 2 and hereafter; col 4, lines 49-51;

- converting the baseband transmission signal to analog within GMSK modulator module 27 so that it outputs an analog quadrature signal 28i, 28Q to analog modulator 210 containing analog mixers 211i, 211Q; col 4, lines 49-54);

- mixing means (211i, 211Q) for producing a signal at the carrier frequency (output signal at 217; col 4, lines 55-65) from the quadrature baseband transmission signal by means of the TX mixing signal (col 4, lines 55-63);

- a transmitter amplifier (219) for amplifying the signal at the carrier frequency (col 4, lines 64-66),

- a synthesizer (215) for generating a TX mixing signal at the transmit frequency (col 4, lines 55-63);

- antenna means (221) for transmitting the amplified transmission at the carrier frequency (col 4, lines 66-67);

wherein the signal processing parts (DSP 24, synthesizer 215) for processing transmit frequency signal are common for signals received from at least two different interfaces (interfaces of two different systems GSM DCS 1800 cellular radio and system

Globalstar satellite radio received via antenna 221, 226 being downconverted using the same synthesizer 215 and DSP1 24 or signal processing parts as the transmission parts; see figure).

Auvray doesn't specifically disclose:

specific means for generating a digital quadrature baseband signal and an analog to digital converter within the GMSK modulator.

Razavi discloses specific means (Gaussian filter, integrator, sine ROM and cosine ROM; see figure 5.38; pages 150-151) for generating a digital quadrature baseband signal and an analog to digital converter (DAC; figure 5.38; pages 150-151) (wherein a digital quadrature baseband signal is produced after the digital Gaussian filter produces a phase to be mapped into an in phase and quadrature component, at sine ROM and cosine ROM, within the GMSK baseband pulse shaping in GMSK systems, pages 150-151). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have specific means for generating a digital quadrature baseband signal and an analog to digital converter within the GMSK modulator of Auvray in order to output an analog quadrature baseband signal to analog mixers of Auvray by specifically producing a digital quadrature signal first from the specific cos ROM and sin ROM components of a typical GMSK modulator system of Razavi for more accuracy purposes from a digitally implemented Gaussian filter instead of analog implementation and then to convert the digital baseband quadrature signal to analog in order to convert to a transmission format recognizable by the analog mixers of Auvray.

Regarding claim 20, Auvray and Razavi disclose the transmitter of claim 12, wherein Auvray discloses the transmitter is characterized in that the signal processing path (mixers 211, LPFs 29i, 29Q, 211i, 211Q, 216, 217, 219, 220, 215, 214, 22, 24, 27) comprises substantially the same components for connecting to the different radio interfaces for transmitting in dual mode.

9. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Isberg et al (US 6,029,052) in view of Auvray (US 5,564,076) as applied to claim 3 above, and further in view of Smith (US 5,796,772).

Regarding claim 4, Isberg et al and Auvray disclose the receiver of claim 3, wherein Isberg et al and Auvray don't disclose the receiver is characterized in that it comprises means for selecting the pass band of the bandpass filter such that it corresponds to the receive frequency. Smith discloses the receiver is characterized in that it comprises means (103; fig. 3) for selecting the pass band of the bandpass filter (117) such that it corresponds to the receive frequency (col 7, lines 37-42). It would have been obvious to one of ordinary skill in the art at the time the invention was made to select the pass band of bandpass filter (12a-12c) of the receiver system of Isberg et al and Auvray in order to allow receiver system to select either narrowband or wideband reception based on the particular frequency mode being in operation or the particular frequency band being received.

10. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Isberg et al (US 6,029,052) in view of Auvray (US 5,564,076) as applied to claim 3 above, and further in view of Rich et al (US 5,758,271).

Regarding claim 5, Isberg et al and Auvray disclose the receiver of claim 3, wherein Isberg et al and Auvray don't further disclose the receiver is characterized in that it comprises means for controlling the gain of said first amplifier.
Rich et al disclose a receiver characterized in that it comprises means (112 to send control signal 133; fig. 2) for controlling the gain of said first amplifier 206 (col 8, line 66 – col 9, line 9). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have gain control means of the first amplifier of the receiver system of Isberg et al and Auvray in order to control the increase/decrease of the signaling power output of the radio frequency amplifier so that it will operate in the frequency mode of interest.

11. Claims 6-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Isberg et al (US 6,029,052) in view of Auvray (US 5,564,076) as applied to claim 3 above, and further in view of Auvray (US 5,953,641).

Regarding claim 6, Isberg et al and Auvray (US 5,564,076) disclose the receiver of claim 3, wherein Isberg et al and Auvray (US 5,564,076) don't further disclose the receiver is characterized in that the means for generating a mixing signal at the receive frequency comprises an RX synthesizer and a controllable frequency divider for dividing the frequency of the output signal generated by the RX synthesizer.

Auvray (US 5,953,641) discloses a receiver characterized in that the means for generating a mixing signal at the receive frequency comprises an RX synthesizer (SYN) and controllable frequency divider (DIV) for dividing the frequency of the output signal generated by the RX synthesizer (SYN; see fig. 1; col 4, lines 33-65). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a controllable frequency divider after the synthesizer output of Isberg et al and Auvray in order to change the frequencies by a factor to provide channel selection and obtain the frequencies of another frequency band in response to the requirements of another communication system as suggested by Auvray (US 5,953,641; col 4, lines 33-40).

Regarding claim 7, Isberg et al, Auvray (US 5,564,076), and Auvray (US 5,953,641) disclose the receiver of claim 6, wherein Auvray (US 5,953,641) further discloses the receiver is characterized in that the frequency divider (DIV) is arranged so as to divide the output signal of the RX synthesizer (OL) always at least by two (col 4, lines 52-55) in order to generate a RX mixing signal (OL') (see fig. 1; col 4, lines 33-65).

12. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Isberg et al (US 6,029,052) in view of Auvray (US 5,564,076) and further in view of Duong et al (US 5,511,235).

Regarding claim 8, Isberg et al and Auvray disclose the receiver of claim 3, wherein Isberg et al and Auvray don't further disclose the receiver is characterized in that it comprises means for controlling the cut-off frequency of low-pass filtering in order to perform channel filtering to the selected radio interface. Duong et al disclose the

receiver is characterized in that it comprises means C1, C2 into LPFs 144, 145 (fig. 1) for controlling the cut-off frequency of low-pass filtering via filters 144, 145 in order to perform channel filtering to the selected radio interface (col 3, lines 25-32; col 5, lines 8-10; col 4, lines 54-63). It would have been obvious to one of ordinary skill in the art at the time the invention was made to control the low pass filtering of the receiver system of Isberg et al and Auvray in order to reduce energy leakage from strong channels which may cause erroneous measurements in adjacent channels as suggested by Duong et al (col 4, lines 59-61).

13. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Isberg et al (US 6,029,052) in view of Auvray (US 5,564,076) and further in view of Eklof (US 6,308,050).

Regarding claim 9, Isberg et al and Auvray disclose the receiver of claim 3, wherein Isberg et al and Auvray don't further disclose: the receiver is characterized in that it comprises means for implementing channel filtering realized in a digital manner. Eklof discloses the receiver is characterized in that it comprises means 122 for implementing channel filtering realized in a digital manner (fig. 1; col 4, lines 45-47). It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement channel filtering realized in a digital manner in the modified receiver system Isberg et al and Auvray in order to extract the lowest frequency band for demodulation as suggested by Eklof (col 4, lines 45-47).

14. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Isberg et al (US 6,029,052) in view of Auvray (US 5,564,076) and further in view of Heck et al (US 5,483,691).

Regarding claim 10, Isberg et al and Auvray disclose the receiver of claim 3, wherein Isberg et al and Auvray don't further disclose:

the receiver is characterized in that it comprises means for controlling the gain of the second amplifier. Heck et al disclose the receiver is characterized in that it comprises means (122, 116; fig. 1) for controlling the gain of the second amplifier (Baseband Amp 114 or 118 figure 1). It would have been obvious to one of ordinary skill in the art at the time the invention was made to gain control the base-band amplifier of Isberg et al and Auvray in order to adjust the baseband signal to a desired level for signal processing while protecting the stages before the baseband amplifiers from overdriving while maintaining a good signal to noise ratio as suggested by Heck et al (col 3, lines 13-18).

15. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Isberg et al (US 6,029,052) in view of Auvray (US 5,564,076) and further in view of Abbey (US 6,151,354).

Regarding claim 13, Isberg et al and Auvray disclose the transmitter of claim 12, wherein Isberg et al and Auvray don't further disclose the transmitter is characterized in that it comprises a controllable low-pass filter for filtering a baseband transmission signal within baseband processor in order to perform channel filtering according to the

radio interface selected. Abbey discloses a transmitter characterized in that it comprises a controllable low-pass filter 152A for filtering a baseband transmission signal within baseband processor 51 in order to perform channel filtering according to the radio interface selected (fig. 6; col 11, lines 51-62). It would have been obvious to one of ordinary skill in the art at the time the invention was made to controllably low pass filter the baseband transmission signal of Isberg et al and Auvray in order to selectably cutoff frequencies above a certain point to extract the desired baseband signal within a certain frequency range of requirements as suggested by Abbey (see fig. 6 clock rate/ filter cutoff select control input to low pass filter 152A) of the particular system of Isberg et al and Brown et al for upconverting and transmitting.

16. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Auvray (US 5,564,076) in view of Razavi (RF Microelectronics, copyright 1998) and further in view of Sim (US 5,825,809).

Regarding claim 14, Auvray and Razavi disclose the transmitter of claim 12, wherein Auvray and Razavi fail to further disclose the transmitter is characterized in that it comprises means for implementing channel filtering realized in a digital manner. Sim discloses the transmitter characterized in that it comprises means for implementing channel filtering realized in a digital manner (col 3, lines 4-23; col 4, lines 8-29). It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement channel filtering in a digital manner in the receiver system of Auvray

and Razavi in order to reduce the hardware requirements for realizing the filter of Auvray and Razavi as suggested by Sim (abstract, lines 18-20).

17. Claims 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Auvray (US 5,564,076) in view of Razavi (RF Microelectronics, copyright 1998) in view of Auvray (US 5,953,641).

Regarding claim 15, Auvray (US 5,564,076) and Razavi disclose the transmitter of claim 12, wherein Auvray (US 5,564,076) further discloses the transmitter is characterized in that the means for generating a TX mixing signal at the transmit frequency comprises a TX synthesizer (215; see figure 2; col 4, lines 55-63). Auvray (US 5,564,076) and Razavi fail to further disclose:

a controllable frequency divider for dividing the frequency of the output signal generated by the TX synthesizer. However, Auvray (US 5,953,641) discloses a controllable frequency divider (DIV) for dividing the frequency of the output signal generated by the TX synthesizer (see fig. 1; col 4, lines 33-65). Therefore, would have been obvious to one of ordinary skill in the art at the time the invention was made to use a controllable frequency divider in order to change the frequencies by a factor and channel selection to obtain the frequencies of another frequency band to respond to the requirements of another communication system as suggested by Auvray (US 5,953,641; col 4, lines 33-40).

Regarding claim 16, Auvray (US 5,564,076), Razavi, and Auvray (US 5,953,641) disclose the transmitter of claim 15, wherein Auvray (US 5,953,641) further discloses

the transmitter is characterized in that said frequency divider (DIV) is arranged so as to divide the TX synthesizer's output signal (OL) always at least by two in order to generate a TX mixing signal OL' (col 4, lines 33-48; fig. 1).

18. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Auvray (US 5,564,076) and Razavi (RF Microelectronics, copyright 1998) and further in view of Igarashi et al (US 5,926,749).

Regarding claim 17, Auvray and Razavi disclose the transmitter of any one of claim 12 characterized in that it comprises means for controlling the gain of the transmitter amplifier. Igarashi et al disclose a receiver characterized in that it comprises means (VAGC through Q14) for controlling the gain of the transmitter amplifier (col 3, lines 31-45). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the transmitter amplifier (219) of Auvray and Razavi controlled in order to adjust the amplifier's gain to obtain the desired signal level output at the transmitting antenna.

19. Claims 18-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Auvray (US 5,564,076) and Razavi (RF Microelectronics, copyright 1998) and further in view of Smith et al (US 5,796,772).

Regarding claim 18, Auvray and Razavi disclose the transmitter of any one of claim 12, wherein Auvray and Razavi don't further disclose the transmitter is characterized in that it comprises means for controlling the operating frequency band of

the transmitter amplifier. Smith et al further disclose the transmitter is characterized in that it comprises means (103) for controlling the operating frequency band of the transmitter amplifier (col 6, line 63 – col 7, line 5; fig. 2). It would have been obvious to one of ordinary skill in the art at the time the invention was made to control the operating band of the transmitter amplifier (219) of Auvray and Razavi in order to quickly adjust the amplifier to function in the particular band that is received as suggested by Smith (col 6, line 67 – col 7, line 2).

Regarding claim 19, Auvray and Razavi disclose the transmitter of any one of claims 12, wherein Auvray and Razavi don't further disclose the transmitter is characterized in that it comprises a filter for filtering the amplified transmission signal at the carrier frequency, and means for selecting the pass band of the transmitter bandpass filter so that it corresponds to the transmission frequency. Smith et al disclose the transmitter is characterized in that it comprises a filter (117) for filtering the amplified transmission signal at the carrier frequency (fig. 2; col 7, lines 5-12), and means (103) for selecting the pass band of the transmitter bandpass filter (117) so that it corresponds to the transmission frequency (fig. 2, col 7, lines 5-12). It would have been obvious to one of ordinary skill in the art at the time the invention was made to add a band pass filter for filtering the amplified transmission signal and means for selecting the pass band of the band pass filter to the system of Auvray and Razavi in order to transmit only a certain band of frequencies within the mode of operation and to have the to select reception of narrowband or wide band spread spectrum modulation based on the requirements of the mode in operation as suggested by Smith et al (col 7, line 3-12).

Conclusion

20. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Rostoker et al (US 6,006,105), Multi-Frequency Multi-Protocol Wireless Communication Device.

- Bartusiak (US 6,016,422), Method and Apparatus for Generating Radio Frequency Quadrature LO Signals for Direct Conversion Transceivers.

- Jakobsson (US 6,246,867), Method and Apparatus for Saving Current while Performing Signal Strength Measurements in a Homodyne Receiver .

- Schlang et al (US 5,963,852), Dual Band Mobile Station.

- Matero (US 6,215,988), Dual Band Architectures for Mobile Stations.

21. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lana N Le whose telephone number is (703) 308-5836. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward F Urban can be reached on (703) 305-4385. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Lana Le

October 2, 2004